A1250-1

MAY 27, 1985

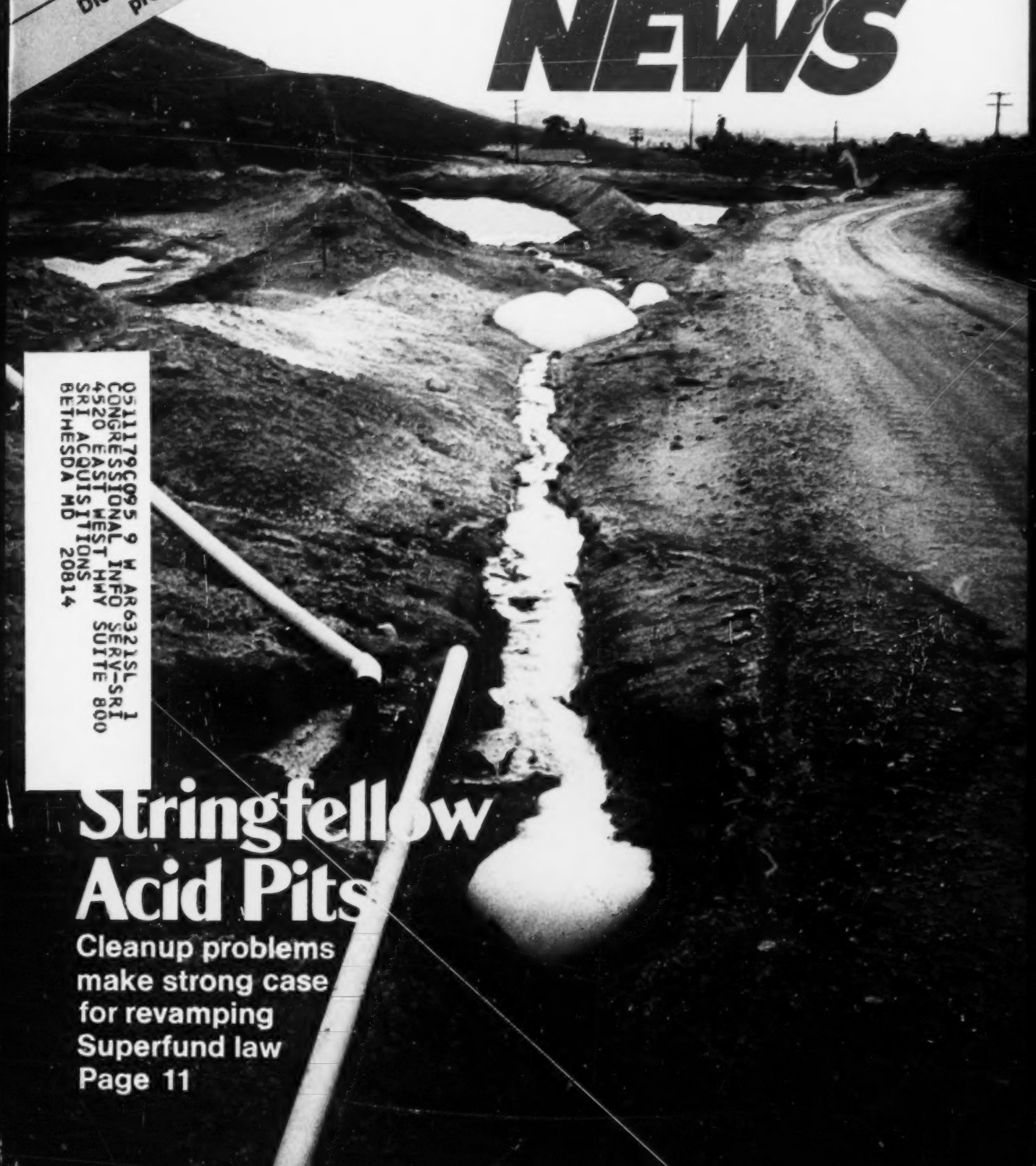
CHEMICAL & ENGINEERING

NEWS

Chemical capacity use flat in first quarter Page 24

Dioxins in the environment probed Page 41

05111790095 9 M AR6321SL 1
CONGRESSIONAL INFO SERV-SRI
4520 EAST WEST HWY SUITE 800
SRI ACQUISITIONS
BETHESDA MD 20814



Stringfellow Acid Pits

Cleanup problems make strong case for revamping Superfund law

Page 11

CHEMICAL & ENGINEERING NEWS

Volume 63, Number 21
CENEAR 63 (21) 1–76
ISSN 0009-2347

MAY 27, 1985

News of the Week

■ **House trio introduces bill to force EPA regulation to cut air emissions of 85 industrial chemicals.** **Page 6**

■ **Allied and Signal probably will sell some of their businesses after they merge.** **Page 7**

■ **EPA agreement with Westinghouse requires company to clean up six PCB-contaminated waste sites in Indiana.** **Page 7**

■ **Italian appeals court drops or reduces charges against company executives involved in dioxin disaster in Seveso in 1976.** **Page 7**

■ **Funding support for binary arms squeaks by Senate.** **Page 8**

■ **Studies link oncogene N-*myc* to resistance to cancer therapy.** **Page 8**

Business

U.S. chemical plant capacity use in the first quarter is about level with that of third-quarter 1984. **Page 24**

International Business

Switzerland's Lonza and U.K.'s Fine Organics aim to specialize in areas unattractive to big producers to boost sales. **Page 30**

Government

Both houses of Congress propose freezing, or reducing, federal government's research and development budget. **Page 36**

National Academy of Engineering's Decade III campaign seeks to ensure U.S. scientific and technological leadership. **Page 38**

Science

From ACS meeting: dioxin data expanding but no consensus on health risk; pesticides from plants' natural defensive weapons; polymer-supported catalysts; polymer models for enzymes; chemical oscillators; LC retention mechanisms; large molecules and mass spectrometry; new synthesis routes in ceramics. **Page 41**

Technology

From Miami Beach: methods to remove bitterness in citrus products; amine purification using calcium bromide. **Page 58**

Cover: Stringfellow acid pits in Glen Avon, Calif., in 1978 before clay cap was placed over open evaporation ponds. Photo courtesy of EPA

Letters 4

Concentrates
Business 22
Government 32
Science/Technology 40

The Departments
Meetings 60
Newscripts 76

News Focus

Thirteen years after Stringfellow acid pits stopped receiving liquid toxic wastes, groundwater is still being fouled; Superfund revamping called for. **Page 11**

Chemical Plant Capacity Use Leveling Out

Use rate for basic chemicals at 77% in first quarter was about same as 1984's third quarter; polymers recovered, moving up to 80% from 76%

William J. Storck, C&EN New York
Bruce F. Greek, C&EN Houston

Chemical plant capacity utilization since the most recent recession has been a seesaw affair, rising and falling as chemical producers reopen shutdown plants to keep up with demand, which doesn't always take up all of the capacity that is reopened.

By the end of this year's first quarter, however, chemical producers seemed to have changed their capacity mix just enough to hold utilization rates at about the same levels overall as in third-quarter 1984. And demand has picked up enough to pull use rates up substantially from last year's first quarter.

According to C&EN's twice yearly survey of major chemical products, capacity use for basic chemicals averaged about 77% of nameplate capacity, compared with an average use rate of about 78% in the third quarter of 1984, but up from 72% in first-quarter 1984.

Average capacity utilization for the major downstream polymers, which had been down in third-quarter 1984 from the first quarter, regained almost all of the ground lost, averaging 80% of nameplate capacity in the first quarter this year, compared with 76% in the third quarter and 81% in the first quarter of 1984.

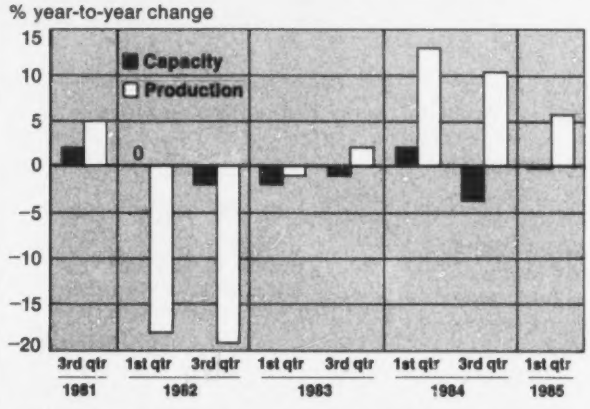
Capacity utilization is an important measure of the industry's health and is used as an indicator for the need for new production facilities and for increased capital spending. However, capacity utilization rates have risen much more slowly in the past couple of years than is normal for the chemical industry in times of economic expansion. Thus, plants have been delayed and capital spending generally has been sluggish.

This may be changing, since in C&EN's annual survey of chemical company capital spending, firms indicated that monies going for new plant and equipment in 1985 would be up an average of 17% over 1984, which itself was up just 2% from the previous year (C&EN, Dec. 24, 1984, page 16).

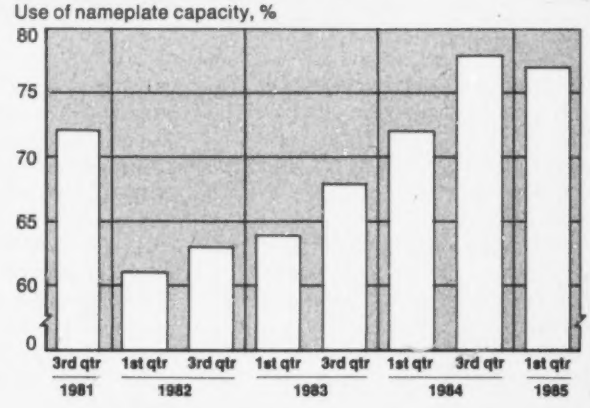
However, it remains to be seen whether this rosy forecast of capital spending bears out in the long run. There still have been few new plant announcements by producers, especially by makers of the large-volume and still fairly depressed basic chemicals. Producers generally have been content to reopen older, less efficient plants and to increase production efficiencies in plants that already are running.

Then, too, production increases normally seen during postrecession years have just not shown up in the past couple of years. Those increases, which started off strongly just after the recession, have tapered off as

Basic chemicals production has risen and capacity has remained about level . . .



. . . sending capacity use rates up from year-earlier quarter



Sources: Industry and government data, C&EN estimates for 33 leading chemicals

Capacity utilization for basic chemicals has changed little since third-quarter 1984

Billions of lb unless otherwise noted[a]	First-quarter 1985 Capacity (nameplate)	First-quarter 1985 Capacity use Nameplate	First-quarter 1985 Capacity use Effective	Third-quarter 1984 Capacity (nameplate)	Third-quarter 1984 Capacity use Nameplate	Third-quarter 1984 Capacity use Effective	First-quarter 1984 Capacity (nameplate)	First-quarter 1984 Capacity use Nameplate	First-quarter 1984 Capacity use Effective
Petrochemicals—olefins and aromatics[b]									
Ethylene	36.5	82%	92%	36.0	91%	100%	36.5	82%	91%
Propylene (chemical and polymer)	21.8	72	80	22.0	77	86	23.0	59	65
Butadiene[c]	3.9	61	68	4.5	58	64	4.5	51	56
Benzene (bg)	2.4	67	75	2.3	64	71	2.4	51	57
***p*-Xylene**	5.7	85	100	5.2	86	100	4.9	85	100
Petrochemicals—C_1 derivatives									
Ammonia (mt)	18.5	91	95	17.5	89	93	17.8	88	91
Urea (mt)[b]	7.8	92	102	7.8	82	92	7.8	83	92
Methanol (bg)	1.9	58	65	1.7	74	83	1.9	60	67
Formaldehyde	8.5	64	67	9.2	61	65	9.2	56	59
Chlor-alkalies									
Chlorine (mt)	13.8	70	73	14.0	72	76	13.4	72	76
Caustic soda (mt)	14.6	70	73	14.9	72	76	14.3	68	72
Soda ash (mt)	11.0	72	76	11.0	74	78	11.0	77	81
Acids									
Sulfuric (mt)[b]	57.5	66	70	58.3	67	70	58.0	66	69
Phosphoric (P_2O_5, mt)[b,d]	12.7	81	85	12.5	87	91	12.5	82	86
Industrial gases									
Oxygen, **Nitrogen** (total, liquid ttd)	39.4	66	82	39.4	65	75	39.4	61	75
Carbon dioxide (ttd)[e]	19.0	73	81	19.0	73	74	19.0	67	74
Mineral-based inorganics[b]									
Sulfur (total, mmt)	18.0	52	—	17.0	55	—	17.0	31	—
Potash (mt)	1.6	135	—	2.2	90	--	2.2	55	—
Phosphorus	0.5	77	82	0.5	93	98	0.6	67	70
Plastics intermediates									
Styrene	8.5	80	94	8.2	95	110	7.8	92	108
Vinyl chloride	9.7	84	93	9.7	69	76	10.0	54	61
Toluene diisocyanate	0.6	122	136	0.7	84	93	0.7	102	113
Fiber intermediates									
DMT-PTA[f]	7.6	70	83	7.6	70	83	7.6	82	97
Ethylene oxide	7.0	87	97	7.0	86	95	7.4	84	93
Cyclohexane[b]	3.1	52	56	3.4	83	89	3.4	62	66
Adhesives, coatings intermediates									
Phenol	3.2	86	95	3.2	74	83	3.3	85	94
Vinyl acetate	2.4	69	73	2.4	99	105	2.4	87	92
Pigments									
Carbon black	3.3	81	90	3.3	87	96	3.3	86	96
Titanium dioxide	0.9	83	97	0.9	97	115	0.9	84	98
Solvents									
Acetone	2.8	64	71	2.8	59	66	2.8	67	75
Ethanol (mg)	210.0	81	90	210.0	88	98	240.0	78	91
Methylene chloride	0.8	65	72	0.8	65	72	0.8	69	77
AVERAGE		**77%**	**84%**		**78%**	**86%**		**72%**	**82%**

a bg = billions of gal, mt = millions of tons, ttd = thousands of tons per day, mmt = millions of metric tons, mg = millions of gal. b Substantial capacity currently shut down. c Total extraction capacity, which runs 25% more than basic production capacity. d Includes both wet process and furnace process capacity. e Excludes oilfield operations. f Dimethyl terephthalate and DMT equivalents of purified terephthalic acid. **Sources:** Industry and government sources, C&EN estimates

U.S. companies have faced demand constrained by imports and increased competition from cheaper foreign products in overseas markets. This double whammy in foreign trade brought about by the strong U.S. dollar has kept chemical plant operating rates unusually low.

As a result, production has been anything but healthy. According to U.S. government figures, output of basic chemicals in the first quarter on a seasonally adjusted basis was up 1.6% from the fourth quarter but was just 0.6% ahead of third-quarter 1984.

The other factor holding back chemical capital spending is pricing. With demand down, and thus capacity utilization rates off, chemical producers have been finding it difficult to gain customer acceptance for price increases. Therefore, rates of return on chemical plants have been depressed, making new investment decisions difficult in the face of still high interest rates.

Myron T. Foveaux, deputy trade adviser, Office of the Chemical In-

Capacity utilization rates rise for polymers in first quarter

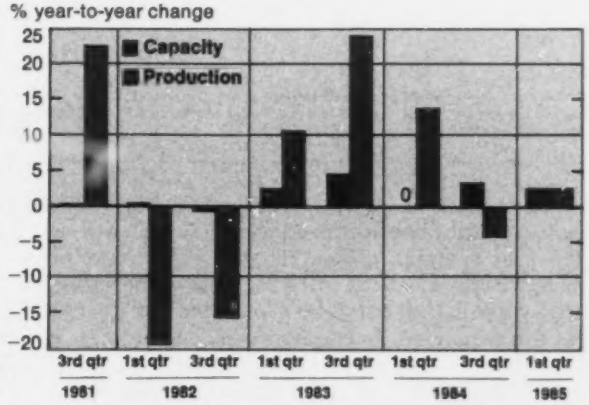
Billions of lb per year	First-quarter 1985 Capacity (nameplate)	First-quarter 1985 Capacity use Nameplate	First-quarter 1985 Capacity use Effective	Third-quarter 1984 Capacity (nameplate)	Third-quarter 1984 Capacity use Nameplate	Third-quarter 1984 Capacity use Effective	First-quarter 1984 Capacity (nameplate)	First-quarter 1984 Capacity use Nameplate	First-quarter 1984 Capacity use Effective
PLASTICS									
Polyethylene, low density	10.1	84%	94%	10.3	79%	84%	10.1	83%	88%
Polyvinyl chloride	8.5	80	94	8.7	61	72	8.3	78	92
Polyethylene, high density	6.8	92	96	7.1	87	92	6.8	87	91
Polypropylene	5.6	88	97	5.4	91	101	5.3	90	100
Polystyrene	5.5	69	81	5.6	69	81	5.1	67	78
AVERAGE		**82%**	**92%**		**78%**	**86%**		**81%**	**90%**
SYNTHETIC FIBERS									
Filament yarn									
Polyester	1.5	83	89	1.5	74	79	1.5	84	90
Nylon	2.0	74	79	1.9	79	85	1.9	85	92
Olefin	1.2	81	85	1.1	62	65	1.1	63	67
Staple									
Polyester	2.8	71	76	2.8	78	83	2.8	82	87
Nylon	1.1	73	78	1.0	74	78	0.99	89	95
Acrylic	0.8	82	87	0.81	80	85	0.83	83	88
AVERAGE		**77%**	**82%**		**74%**	**79%**		**81%**	**86%**
OVERALL AVERAGE		**80%**	**87%**		**76%**	**83%**		**81%**	**88%**

Sources: Society of the Plastics Industry, Textile Economics Bureau, industry sources, C&EN estimates

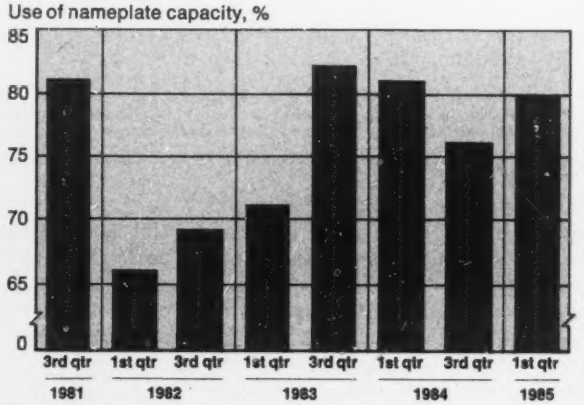
dustry Trade Adviser, and assistant director of government relations for the Chemical Manufacturers Association, indicated to a meeting of the Synthetic Organic Chemical Manufacturers Association at Absecon, N.J., earlier this month that the price situation, especially for petrochemicals, is pretty gloomy. "Petrochemicals are being sold today at prices that recover just operating, but not fixed, costs," he said. "Operations are running at a cash-producing, but not reinvestment, level. There are few plans to build new capacity for most petrochemicals in the next few years. Existing plants are getting older and proceeding to obsolescence. There is little prospect that prices will improve enough to ensure U.S. investors a reinvestment rate of return on new plants."

This whole situation could change if the dollar weakens and interest rates drop. A weakening of the dollar could bring about some slight resurgence of export markets and could keep some foreign products out of the U.S., thus increasing demand for U.S. plants. And lowering of interest rates would mean that cash for expansion could be borrowed at rates closer to the rate of return for the chemical plants involved. But, Foveaux warns, even a weakening of the dollar may not help much. Foreign producers in the past two years have set up distribution networks that they will be forced to protect against a lowering of the relative U.S. price. And, he says, in many cases, 10% of a market will set the price for a chemical product. Thus, according to Foveaux, U.S. chemical producers may still be forced, even with a drop in the relative value of the

Both capacity and production of polymers have increased . . .



. . . resulting in a modest increase in capacity use rate



Sources: Society of the Plastics Industry, Textile Economics Bureau, industry sources, C&EN estimates

C&EN capacity use indicator: the ground rules

Capacity use at chemical plants is difficult to measure and requires certain assumptions. These bring some order to the maze of variables affecting this critical indicator of the industry's health.

With the help of industry and government sources, C&EN measures capacity use as a percentage of both nameplate and effective maximums. Nameplate capacity is the official design capacity of plants. Effective capacity is the practical maximum after reductions for unplanned maintenance, corrosion problems, changes in product mix, and other influences. Although engineering companies and industry statistics groups try to make nameplate capacity data as real as possible, practical problems almost always reduce effective maximums to 85 to 95% of the official totals. For short periods, plants can run at more than 100% of effective top capacity, but such a rate doesn't last more than a few months.

Capacity use is given over as much of a calendar quarter as production data permit, with no seasonal adjustment. The figures are for plants actually operable. At present, some products such as ethylene, ethanol, chlorine, polystyrene, ammonia, and urea have plants temporarily shut down because of weak markets. These plants still are included in capacity totals. The totals exclude new plants just starting up and old plants out of operation for long periods because of accidents. As much as possible, capacity figures stay current with expansions.

Capacity data don't take into account other temporary fluctuations for fuel and electric power interruptions, equipment failure, and feedstock scarcity or substitution. The feedstock variables, for example, have been important in the past few years in ethylene production, altering maximum output for several coproducts such as propylene, butadiene, and benzene.

Products in C&EN's capacity use survey are the same as those in the Key Chemicals and Key Polymers series. These are the core products of the industry, the building blocks leading to downstream production of thousands of more specialized products.

dollar, to hold prices down to meet foreign competition.

A good example of the effects of foreign competition can be seen in synthetic fibers, use rates for which managed to eke out a rise to 77% of nameplate capacity in the first quarter, compared with 74% in last year's third quarter. But the rate is down from an average of 81% in the first quarter last year—this in spite of a resurgent housing market, increased discretionary spending by consumers, and plant closings within the industry. The main problem is not imports of fibers, but imports of finished and semifinished goods from abroad.

Only a few individual synthetic fibers increased in capacity use rates, contributing to the average increase in overall fibers capacity utilization in the first quarter of this year. For instance, polyester filament increased to 83% of nameplate capacity in the first quarter compared with 74% in the third quarter, and acrylic staple increased to 82% from 80%. More fibers, however, either dropped or maintained their depressed levels. Nylon filament fell to 74% in the first quarter from 79% in the third, and nylon staple slipped slightly to 73% from an already low 74%. Polyester staple dropped to 71% from 78%.

Thermoplastics faced largely the same situation of foreign competition of finished and semifinished goods, but producers managed to overcome some of the problems to raise capacity utilization to an average of 82% from 78% in the third quarter and 31% in the first quarter last year. Showing the most improvement in this year's first quarter was polyvinyl chloride, whose utilization rate climbed to 80% from a much depressed 61% in the third quarter of 1984. In the first quarter of last year, the use rate for PVC was 78%.

For the remaining thermoplastics, there was little change in utilization rates. Capacity use for low-density polyethylene increased to 84% from 79%; high-density polyethylene rose to 92% from 87%; polypropylene dropped to 88% from 91% as some new capacity came on stream; and polystyrene stayed at 69%, even with a slight decline in capacity.

Increases in capacity utilization in the downstream products are hardly reflected in the basic chemicals, however. For these, plant capacity use rates declined a slight amount to an average of 77% from 78% in the third quarter of 1984, but are up some from 72% in first-quarter 1984.

For the first quarter this year, both the 20 organic products and the 13 inorganic chemicals surveyed showed average capacity use rates of 77%, compared with 78% for both in the third quarter. In the first quarter last year, however, capacity utilization for the organics averaged 74% and that for the inorganics averaged 68%.

The chief reason for the rapid rise for the inorganics last year and the subsequent leveling off this year was the ending of the government's payment-in-kind (PIK) crop set-aside program, which cut into fertilizer demand drastically. This has pulled fertilizer chemicals up substantially, raising the average for all the inorganics.

The end of the PIK program gave a shot in the arm to fertilizers specifically, and inorganics generally, but in the near term there are probably no more single events that will have the major effect that the termination of this program did. Thus, chemical producers must resign themselves to slow growth in capacity use for some time. Last week's lowering of interest rates may well help pull down the value of the dollar somewhat and thus help exports, but this is a long-term solution.

With the economic expansion proceeding only slowly, there is little hope for many, especially basic, chemical products to get back to historic operating rates in the 80 to 90% range—the range that will justify new plant expansions. □